OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: ShereVere Walker

Address: P.O. Box 473901

City: Aurora

State: CO: Colorado Zip Code: 80047

B. DUNS No. 052769251

II. Is the applicant currently receiving EPA Assistance? ☐ Yes ☒ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/a

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/a

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

N/a

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95) ☒ Yes ☐ No

a. Do the methods of notice accommodate those with impaired vision or hearing? ☒ Yes ☐ No

b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications? ☒ Yes ☐ No

c. Does the notice identify a designated civil rights coordinator? ☒ Yes ☐ No

VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a)) ☒ Yes ☐ No

IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166) ☒ Yes ☐ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

N/A

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

N/A

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
ShereVere Walker	Executive Director	03/25/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: | First Name: ShereVere | Middle Name:
Last Name: Walker | Suffix:
Title: Executive Director
Complete Address:
Street1: 1445 Dayton St
Street2:
City: Aurora | State: CO: Colorado
Zip / Postal Code: 80010-3232 | Country: USA: UNITED STATES
Phone Number: 720-742-7844 | **Fax Number:**
E-mail Address: blackparentsunitedfoundation@gmail.com

Payee: *Individual authorized to accept payments.*

Name: Prefix: | First Name: ShereVere | Middle Name:
Last Name: Walker | Suffix:
Title: Executive Director
Complete Address:
Street1: 1445 Dayton St
Street2:
City: Aurora | State: CO: Colorado
Zip / Postal Code: 80010-3232 | Country: USA: UNITED STATES
Phone Number: 710-742-7844 | **Fax Number:**
E-mail Address: blackparentsunitedfoundation@gmail.com

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: | First Name: ShereVere | Middle Name:
Last Name: Walker | Suffix:
Title: Executive Director
Complete Address:
Street1: 1445 Dayton St
Street2:
City: Aurora | State: CO: Colorado
Zip / Postal Code: 80010-3232 | Country: USA: UNITED STATES
Phone Number: 720-742-7844 | **Fax Number:**
E-mail Address: blackparentsunitedfoundation@gmail.com

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: Dr. First Name: Detlev Middle Name:

Last Name: Helmig Suffix:

Title:

Complete Address:

Street1: 2820 Lafayette Dr.

Street2:

City: Boulder State: CO: Colorado

Zip / Postal Code: 80305-7107 Country: USA: UNITED STATES

Phone Number: 303-499-3174 **Fax Number:**

E-mail Address: dh.bouldair@gmail.com

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1236-Supplemental File B - Data Quality Assurance

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1234-Project Narrative Final.pdf

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/25/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Black Parents United Foundation

* b. Employer/Taxpayer Identification Number (EIN/TIN): 86-2839473

* c. Organizational DUNS: 0527692510000

d. Address:

* Street1: 1445 Dayton St
Street2:
* City: Aurora
County/Parish:
* State: CO: Colorado
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 80010-3232

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: ShereVere
Middle Name:
* Last Name: Walker
Suffix:

Title: Executive Director

Organizational Affiliation:

* Telephone Number: 720-742-7844
Fax Number:

* Email: blackparentsunitedfoundation@gmail.com

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Characterization of Ozone, Ozone Precursors, and Atmospheric Volatile Organic Compounds Related to Oil and Natural Gas Operations in Aurora, Colorado

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 6th
* b. Program/Project: 6th

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 11/01/2022
* b. End Date: 11/01/2025

18. Estimated Funding ($):

* a. Federal	472,656.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	472,656.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	
* First Name:	ShereVere
Middle Name:	
* Last Name:	Walker
Suffix:	
* Title:	Executive Director
* Telephone Number:	720-742-7844
Fax Number:	
* Email:	blackparentsunitedfoundation@gmail.com
* Signature of Authorized Representative:	ShereVere Walker
* Date Signed:	03/25/2022

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Characterization of Ozone, Ozone Precursors, Atmospheric Volatile Organic Compounds, and Particulate Matter Related...	66.034	$	$	$ 499,920.00	$	$ 499,920.00
2.						
3.						
4.						
5. Totals		$	$	$ 499,920.00	$	$ 499,920.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
	Characterization of Ozone, Ozone Precursors, Atmospheric Volatile Organic Compounds, and Particulate Matter Related...	N/A			
a. Personnel	$ 15,120.00	$ 20,790.00	$	$	$ 35,910.00
b. Fringe Benefits					
c. Travel	105.00				105.00
d. Equipment					
e. Supplies					
f. Contractual	463,905.00				463,905.00
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)	479,130.00	20,790.00			$ 499,920.00
j. Indirect Charges					$
k. TOTALS (sum of 6i and 6j)	$ 479,130.00	$ 20,790.00	$	$	$ 499,920.00
7. Program Income	$	$	$	$	$

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Characterization of Ozone, Ozone Precursors, Atmospheric Volatile Organic Compounds, and Particulate Matter Related...	$	$	$	$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 483,507.00	$ 483,507.00	$	$	$
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 483,507.00	$ 483,507.00	$	$	$

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Characterization of Ozone, Ozone Precursors, Atmospheric Volatile Organic Compounds, and Particulate Matter Related...	$	$ 16,413.00	$	$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$	$ 16,413.00	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks:

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Black Parents United Foundation (BPUF)
Office Street Address: 1445 Dayton St, Aurora, CO 80010
Office Mailing Address: P.O Box 473901, Aurora, CO 80047
www.blackparentsunitedfoundation.org

Mission and Purpose

The Black Parents United Foundation (BPUF) is a 501(c)3 community-based non-profit organization created to empower parents of black and brown children to empower their children, and to promote equity, diversity, and inclusion through confidence building, community development, and community engagement.

Department of the Treasury
Internal Revenue Service
Tax Exempt and Government Entities
P.O. Box 2508
Cincinnati, OH 45201

Date:
07/20/2021
Employer ID number:
86-2839473
Person to contact:
Name: Customer Service
ID number: 31954
Telephone: (877) 829-5500
Accounting period ending:
December 31
Public charity status:
170(b)(1)(A)(vi)
Form 990 / 990-EZ / 990-N required:
Yes
Effective date of exemption:
March 24, 2021
Contribution deductibility:
Yes
Addendum applies:
No
DLN:
26053488008241

BLACK PARENTS UNITED FOUNDATION
2821 S PARKER RD SUITE 167
AURORA, CO 80013

Dear Applicant:

We're pleased to tell you we determined you're exempt from federal income tax under Internal Revenue Code (IRC) Section 501(c)(3). Donors can deduct contributions they make to you under IRC Section 170. You're also qualified to receive tax deductible bequests, devises, transfers or gifts under Section 2055, 2106, or 2522. This letter could help resolve questions on your exempt status. Please keep it for your records.

Organizations exempt under IRC Section 501(c)(3) are further classified as either public charities or private foundations. We determined you're a public charity under the IRC Section listed at the top of this letter.

If we indicated at the top of this letter that you're required to file Form 990/990-EZ/990-N, our records show you're required to file an annual information return (Form 990 or Form 990-EZ) or electronic notice (Form 990-N, the e-Postcard). If you don't file a required return or notice for three consecutive years, your exempt status will be automatically revoked.

If we indicated at the top of this letter that an addendum applies, the enclosed addendum is an integral part of this letter.

For important information about your responsibilities as a tax-exempt organization, go to www.irs.gov/charities. Enter "4221-PC" in the search bar to view Publication 4221-PC, Compliance Guide for 501(c)(3) Public Charities, which describes your recordkeeping, reporting, and disclosure requirements.

Sincerely,

Stephen A. Martin
Director, Exempt Organizations
Rulings and Agreements

Other Attachment A - Data Quality Assurance and Quality Control Protocols

General Information: All monitoring conducted by Boulder A.I.R. follows regulatory protocols and calibration grades (40 Code of Federal Regulations (CFR) Part 58), where applicable, or alternatively, guidelines and calibration scales established by the World Meteorological Organization (WMO) Global Atmospheric Watch (GAW) program. All measurements are continuous, at 1 minute time resolution, except for VOCs, which are measured over a ten-minute sampling interval hourly. Instrument maintenance, including quality control and assurance protocols are overseen by Boulder A.I.R. staff members Jacques Hueber, Ryan Daly, and Kat Potter. All three of these scientists have Masters, respectively Ph.D. degrees in engineering and atmospheric monitoring applications, and a combined 40+ years of experience in atmospheric monitoring. Each site is visited 2-3 times each week by these scientists for maintenance and calibration tasks. All activities and calibration data are logged in Google Docs files. Two data copies are made every day on local data servers and on storage space purchased on the Amazon Web Server. Data are provided with a metadata file that details the analytical protocol and the precision, uncertainty, and limit of detection of the analysis. Oversight and coordination are provided by Dr. Detlev Helmig, a recipient of an EPA Young Investigator award. D.H. has 35+ years of experience in atmospheric trace gas monitoring and published more than 200 peer-reviewed publications on atmospheric analysis methods and applications. Bios of these personnel are provided as attachments. Measurement specific instrument and QC information are provided below.

Wind Speed/Wind Direction: Campbell Scientific MetSENS500 and RM Young Wind Monitor AQ, 05305-PT mounted on a meteorological tower at ~8.5 m height. Every 6 months, wind speed and wind direction calibrations checks are done using a vane angle stand (RM Young, 18112) and an anemometer drive (RM Young, 200-15,000 RPM, 18802) standard. Yearly audit are performed by CDPHE.

Temperature, Relative Humidity, Barometric Pressure: A Campbell Scientific MetSENS500 is used mounted on a meteorological tower at ~8.5 m height using factory calibration.

Ozone (O_3): A Thermo Scientific model 49C UV absorption monitor is used. Air is pulled from an inlet mounted at 8 m height. The sampling line is 10 m length, ¼ inch o.d., 3/16 inch i.d. PFA tubing with a PFA filter holder housing a 1 micron Teflon membrane filter that is replaced every two months. The calibration scale is referenced against the EPA Region 8 primary ozone standard. Automated daily zero and span checks are done using a Thermo Scientific 49C calibrator. Quarterly, full range linearity checks conducted at 0, 25, 50, 100, 200, 400 ppb. Yearly calibration checks are performed with a level 2 standard (Thermo Scientific 49C calibrator unit) referenced against the EPA Region 8 ozone reference standard (May 20, 2021). Yearly site audits are conducted by CDPHE.

Methane (CH_4): Measurements are conducted with a Picarro G-2401 in air sampled from an inlet at 8 m height. The sampling line is 10 m length, ¼ inch o.d., 3/16 inch i.d. PFA tubing with PFA filter holder that has 1 micron Teflon membrane filter. Filters are replaced every two months. Manufacturer's calibration settings are used. Calibration checks are done every 48 hours with breathing air grade compressed gas from a tank that is cross-referenced to the NOAA GML methane scale; estimated accuracy error of < 2 ppb. When deviations of the monitor exceed 5 ppb, a cross-reference to a second calibration standard is triggered. If this confirms the deviation, then a recalibration of the analyzer is conducted.

Particulate Matter: Measured with an EPA-certified GRIMM EDM180 monitor. Air is sampled from an inlet stack protruding approximately 1 m above the instrument shelter roof. Two size ranges are reported, PM_10 (coarse particles) for all particles smaller than 10 µm, PM_2.5 (fine particles) for all particle mass smaller than 2.5 µm. Weekly zero tests are performed using a 0.25 micron particle filter at the sample inlet. Every 6 months, a field test is done to check the instrument with a 1 micron standard using a nebulizer, followed by 2.5 micron standard.

Volatile Organic Compounds: A VOCs preconcentration unit is interfaced to a gas chromatograph (GC) using flame ionization detection (FID). A sample air inlet is mounted at 8 m height. The sampling

line is 10 m length, ¼ inch o.d., 3/16 inch i.d. PFA tubing, heated to 40°C, with a PFA inlet filter holder housing a 1 micron Teflon membrane filter. Filters are replaced every two months. VOCs are extracted over a 10-minute time window with a custom-built preconcentration system. Sample air is first dried to a dew point of -45°C before VOCs collection on a multi-sorbent media on a -40°C Peltier-cooled focusing trap. An Agilent 8860 GC with a GC column switch is used. Lighter VOCs (ethane through iso-butane) are analyzed on an alumina PLOT column; the heavier VOCs portion on a second DB-624 column. GC separation is by temperature-programmed GC. Approximately twenty VOCs are traced and quantified routinely (including ethane, propane, butane, pentane, hexane, octane, benzene, toluene, acetylene, ethene, propene, isoprene, *cyclo*-pentane, *ethyl*-benzene, *m&p-*, *o*-xylene). The calibration scale is tied to the WMO-GAW, using primary calibration standards from the U.K. National Physics Laboratory. Zero-air blanks are run after each set of 45 ambient samples. A calibration standard is run weekly.

Shere'Vere C. Walker, M.Ed

Ex. 6 Personal Privacy (PP)

Experienced in Nonprofit Leadership, K12 Leadership, Community Development, & Program Development

Education:

Concordia University - Chicago, IL
Ed.D - Educational Leadership
Expected Graduation: June 2022

Concordia University - Portland, OR
Masters of Education: Curriculum and Instruction - Equity, Ethics, and Justice
Completed: February 2014

Delta State University - Cleveland, MS
Bachelors of Science: Family and Consumer Sciences
Minors: Business Administration, Marketing, and Art
Completed: July 2011

Certifications:

Professional License: Secondary (Triple Endorsed) Business/Marketing/English Teacher Certification (Ex: 2024)
Career and Technical Education (CTE) Authorization CTE Business/Marketing: (2023)
Teaching English to Speakers of Other Languages (TESOL) Certification - Certificate Number: 100-150752

Experience:

2021-present: Jeffco Public Schools - Golden, CO
Talent Acquisition Specialist - District Administrator

- Manage recruitment planning, advertising and application screening; supervise the selection and preparation of staffing and promotional materials; schedule and monitor master schedules for high volume recruitment and selection processes
- Research and explore a variety of resources and partnerships which promote a highly qualified, diverse candidate pool that reflects the Jeffco community and student populations; actively create outreach programs which cultivate an open and inclusive workforce.
- Research and analyze occupational data to be utilized in the development of selection methods; ensure validation and reliability of recruitment and staffing processes.

2020-present: Black Parents United Foundation - Denver Metro Area & Mississippi Delta
Founder and Executive Director

- Ensure ongoing local programmatic excellence, rigorous program evaluation, and consistent quality of finance and administration, fundraising, communications, and systems; recommend timelines and resources needed to achieve the strategic goals.
- Actively engage and energize BPUF Nonprofit volunteers, board members, event committees, alumni, partnering organizations, and funders.
- Design the expansion in other cities and complete the strategic business planning process for the program expansion into new markets.

2019-2021: QKids and iTutorGroup - China/Japan/Taiwan
Online ESL Teacher (part time)

- Provide full immersion language and content classes based on the US Common Core State Standard
- Use a flipped-classroom approach to foster creativity and critical thinking skills
- Observe students to supply teachers feedback regarding potential learning blocks and opportunities for support

Ex. 6 Personal Privacy (PP)

2017-2021: Jeffco Public Schools - Lakewood, CO
School Work Based Learning Internships & Apprenticeship Director & PBL/Blended Learning Teacher

- Successfully sustained a work based learning program from the group up by completing over 150 interns, 300 students work site tours, 75 job shadow events throughout the tenure of the program
- Successfully secured and maintained over 150 community/business partnership throughout the Denver Metro Area (internships, apprenticeships, worksite tours, and job shadows)
- 98% success rate of students in the school internship program earning core credits towards graduation by completing a full semester capstone program/e-portfolio while successfully implemented a full industry certification aCNA, OSHA 10, Fleet Maintenance, Graphic Design, and Medical Coding and Billing)

2016-2017: Jeffco Public Schools - Lakewood, CO
Re-engagement Coach & Internship Coordinator

- Developed relationships with local employers and organizations to advocate opportunities for youth. Work with Career and Technical Education to create electronic portfolios and work samples as part of the career exploration curriculum.
- Facilitated student learning by assisting students to secure appropriate internships to enhance overall academic experience and learn skills essential to conducting a successful job search
- Provided optimal marketing strategies to connect students to experiential endeavors and jobs

2013-2016: The New America High School, Lowry - Denver, CO (Charter Schools Institute)
Student Behavior Counselor (Expelled and At-Risk Student Service - EARSS)

- Work with teachers, administration, and staff personnel to identify students who are at risk of suspension or expulsion (other stakeholders include Guardian ad Litem and Probation Officers)
- Implement individualized intervention plans with specific strategies (including advising, counseling, and mentoring programs and services) to address the needs of targeted students and to their families/caregivers
- Provide students with assistance in the areas of academic achievement, and social issues, and life skills (e.g., organization skills, time management, individual and social responsibility, and work ethic) that impact suspension or expulsion rates.

2009-2013: Project LUC (Life Under Control), Jonestown, MS
Founder/Director/ Reading and English Teacher

- Determined feasibility of developing programs to supplement local annual budget allocations
- Submitted grant proposals to officials for approval, and maintained communication via webinar with staff to determine goals and objectives
- Prepare weekly lesson plans to help students prepare for the Mississippi State Test

Professional Accomplishments and Activities:

- 2021 & 2017: Jeffco Public Schools Value Award - District Entrepreneurial Spirit & Valuing People
- 2021-present: National Association for the Advancement of Colored People (NAACP) - Denver, Education Chair
- 2020 Talented Teacher Award
- 2017-present: Tri-County Workforce Committee Jefferson County, Member
- 2014-present: International WeLuvU Foundation - Humanitarian Volunteer
- 2014-2016 : School Base EARSS Grant PLC Lead
- 2014 -2015: New America School Lowry, School Accountability Committee
- 2008-2011: President's and Dean's List Scholar

BIOGRAPHICAL SKETCH Detlev Helmig

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
University of Duisburg, Germany	Ph.D.	1989	Environmental Chemistry
University of Bochum, Germany	Diplom	1986	Analytical Chemistry

PERSONAL STATEMENT

The core of my research is surface-atmosphere gas exchange, atmospheric chemistry, and atmospheric transport. A particular area that I have focused on in recent years is the study of local to regional air quality in relation to oil and gas operations. Since spring 2017, we have been monitoring important air quality indicators at the Boulder Reservoir. This monitoring reflects a series of novel instrumental and data processing advancements that facilitate the near-real time reporting of primary air pollutants at a public website (https://www.bouldair.com/boulder.html). A particular goal is to assess the influence of oil and natural gas development on air quality, and track possible changes from the expansion of the industry closer into Boulder County. The high recognition of this program has motivated neighboring communities to seek similar measurements, leading to the addition of further air quality monitoring stations during the past year. Results have shown surprisingly high concentrations of primary air pollutants, and concerning influences from oil and gas emissions on surface ozone. This is of high significance given that the region has been an EPA-designated non-attainment area for surface ozone. Our findings have received a lot of attention by citizens, environmental groups, and regulators. The public websites that are reporting the monitoring data have been visited some 35,000 times since their launch. We have received a plethora of requests for the data and their interpretation. Results have been published in the peer-review literature, and the program has been presented in public media more than a dozen of times. Findings have been essential pieces of information in recent Colorado legislature sessions on redefining oil and gas regulations.

POSITIONS AND HONORS

Principal, Boulder A.I.R. LLC, 2018-current.
Associate Research Professor, INSTAAR, University of Colorado Boulder, 2003-2020.
Research Scientist III & fellow, INSTAAR, 2001-2020.
Research Scientist, Chemistry Department and the Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, 1995-2001.
Visiting Scientist, National Center for Atmospheric Research, 1992-1996.
Postdoctoral Fellow, Statewide Air Pollution Research Center, Riverside, University of CA, 1989-1992.
US EPA Young Investigator Award, 1996-2001.

CONTRIBUTIONS TO SCIENCE

Invited member of IPCC group for assessing short-lived climate forcers, May 2018-2022.

Editor-in-Chief of the Atmospheric Science Domain, *Elementa* – Science of the Anthropocene (http://elementascience.org/), 2013-current.

Invited member of the World Meteorological Organization (WMO) Global Atmospheric Watch (GAW) scientific advisory group (SAG) on atmospheric reactive gases and WMO-GAW Expert Group for the global monitoring of Volatile Organic Compounds, 2008-current.

Volunteer lecturer at the WMO-GAW – Training & Education Center (2011, 2015, 2018; https://www.gawtec.de), and the School of Atmospheric Measurements in Latin America and the Caribbean (SAMLAC) (2018; http://samlac.uprrp.edu/).

Primary thesis mentor of ten Ph.D. and ten masters' students, and five postdoctoral scientists at the University of Colorado. Student mentor in the CU Boulder Work Study Program, the CU Boulder SMART Program (Summer Multicultural Access to Research and Training), CU Boulder UROP Program (Undergraduate Research Opportunities Program), the NSF Biosphere Atmosphere Research Training (BART), and UCAR SOARS (Significant Opportunities in Atmospheric Research and Science).

SELECTED PUBLICATIONS

Out of 220 total; [lease see https://bouldair.com/ for complete listing. Selected examples:

Rossabi S., Hueber J., Wang W., Milmoe P., and Helmig D. (2021) Spatial distribution of atmospheric oil and natural gas volatile organic compounds in the Northern Colorado Front Range. Elem. Sci. Anthro. 9, DOI: 10.1525/elementa.2019.00036.

Pozzer A., Schultz M.G., and Helmig D. (2020) Impact of oil and natural gas emission increases on surface ozone is most pronounced in the Central United States. Environ. Sci. Technol. https://dx.doi.org/10.1021/acs.est.9b06983.

Helmig D. (2020) Air quality impacts from oil and natural gas development in Colorado. Elem. Sci. Anth. 8, DOI: https://doi.org/10.1525/elementa.398.

Oltmans S.J., Cheadle L.C., Johnson B.J., Schnell R.C., Sterling C., Thompson A.M., Helmig D., Cullis P., Hall E., Jordan A., McClure-Begley A., Sullivan J.T., McGee T.P., and Wolfe D. (2019) Boundary layer ozone in the Northern Colorado Front Range in July-August 2014 during FRAPPE and DISCOVER-AQ from vertical profile measurements. Elem. Sci. Anth. 7, 1-14.

Bien T. and Helmig D. (2018) Changes in the summertime ozone chemistry in Colorado during 2000 – 2015. Elem. Sci. Anth. 6:000300, 1-25, doi: 10.1525/elementa.300.

Rossabi S., and Helmig D. (2018) Changes in atmospheric butanes and pentanes and their isomeric ratios in the Continental United States, J. Geophys. Res. 123, 3772-3790, doi:10.1002/2017JD027709.

Evans J.M., and Helmig D. (2017) Investigation of the influence of transport from oil and natural gas regions on elevated ozone levels in the northern Colorado Front Range. J. Air Waste Manag. Assoc. 67, 196-211.

Helmig D., Stephens C.R., Evans J., Boylan P., Hueber J., and Park J.-H. (2014) Highly elevated atmospheric levels of volatile organic compounds in the Uintah Basin, Utah. Environ. Sci. Technol. 48, 4707-4715, doi:10.1021/es405046r.

Helmig D., Rossabi S., Hueber J., Tans P., Montzka S.A., Masarie K., Thoning K., Plass-Duelmer C., Claude A., Carpenter L.J., Lewis A.C., Punjabi S., Reimann S., Vollmer M.K., Steinbrecher R., Hannigan J.W., Emmons L.K., Mahieu E., Franco B., Smale D., and Pozzer A. (2016) Reversal of global atmospheric ethane and propane trends largely due to US oil and natural gas production. Nature Geosci. 9, 490-495.

BIOGRAPHICAL SKETCH Jacques HUEBER

EDUCATION

Masters in Mechanical Engineering (2003), French Institute for Advanced Mechanics (IFMA), Clermont Ferrand, France

POSITIONS

Self-employed, JH Atmospheric Instrumentation Design, Boulder, CO, 2020-present:

As a contractor for BOULDER A.I.R LLC, currently provided services include the development and construction, field deployment, and routine maintenance of atmospheric monitoring instrumentation. A particular specialization is the construction of Volatile Organic Compounds analytical systems, as well as deployment of these systems at several air monitoring stations in the Colorado Front Range. I strive to provide my sponsors and the public with high quality scientific data for gauging in air quality and directing air pollution regulations.

Senior Professional Research Associate, University of Colorado Boulder, Institute for Alpine and Arctic Research (INSTAAR), 2003-2020:

For 17 years in the INSTAAR Atmospheric Research Laboratory, I contributed to developing, building and deploying various instruments for atmospheric field research. Responsibilities also included operation, supervision, and technical support of science projects in the laboratory and in the field, working alongside undergraduate, graduate and postdoc students. In this setting, I took part in a great diversity of projects, collecting data in the Arctic, Antarctica, and USA. I actively participated in generating 13 years of Volatile Organic Compound (VOC) data in the NOAA/ESRL/GML CCGG Cooperative Air Sampling Network.

SELECTED PEER-REVIEWED PUBLICATIONS

Helmig D., Guenter A., Hueber J., Daly R., Wang W., Park J.-H., Liikanen, A., and Paraplan A.P. (2021) Ozone reactivity measurement of biogenic volatile organic compound emissions. Atmos. Meas. Tech. Dis. https://doi.org/10.5194/amt-2021-354.

Rossabi S., Hueber J., Wang W., Milmoe P., and Helmig D. (2021) Spatial distribution of atmospheric oil and natural gas volatile organic compounds in the Northern Colorado Front Range. Elem. Sci. Anthro. 9, DOI: 10.1525/elementa.2019.00036.

Angot H., Davel C., Wiedinmyer C., Petron G., Chopra J., Hueber J., Blanchard B., Bourgeois I., Vimont I., Montzka S.A., Miller B.R., Elkins J.W., and Helmig D. (2021) Temporary pause in the growth of

atmospheric ethane and propane in 2015-2018. Atmos. Chem. Phys. 21, 15153-15170, https://doi.org/10.5194/acp-21-15153-2021.

Helmig D., Liptzin D., Hueber J., and Savarino J. (2020) Impact of exhaust emissions on chemical snowpack composition at Concordia Station, Antarctica. The Cryosphere 14, 199-209. DOI: 10.5194/tc-14-199-2020.

Helmig, D., Blanchard B., and Hueber, J. (2018) Contrasting behavior of slow and fast photoreactive gases during the August 21, 2017, solar eclipse. Elem. Sci. Anth. 6, 1-13, doi: 10.1525/elementa.322.

Rossabi S., Choudoir M., Helmig D., Hueber J., and Fierer N. (2018) Volatile organic compound emissions from soil following wetting events. J. Geophys. Res. Biogeosciences, 123, 1988-2001, doi:10.1029/2018JG004514.

Agnan Y., Douglas T. A., Helmig D., Hueber J., and Obrist D. (2018) Mercury in the Arctic tundra snowpack: temporal and spatial concentration patterns and trace gas exchanges. The Cryosphere 12, 1939-1956, doi:10.5194/tc-12-1939-2018.

Pollmann J., Helmig D., Liptzin D., Thompson C.R., Hueber J., Tans P.P., and Lelieveld J. (2016) Variability analyses, site characterization, and regional [OH] estimates using trace gas measurements from the NOAA Global Greenhouse Gas Reference Network. Elem. Sci. Anth. 4, 1-20, doi: 10.12952/journal.elementa.000128.

Helmig D., Rossabi S., Hueber J., Tans P., Montzka S.A., Masarie K., Thoning K., Plass-Duelmer C., Claude A., Carpenter L.J., Lewis A.C., Punjabi S., Reimann S., Vollmer M.K., Steinbrecher R., Hannigan J.W., Emmons L.K., Mahieu E., Franco B., Smale D., and Pozzer A. (2016) Reversal of global atmospheric ethane and propane trends largely due to US oil and natural gas production. Nature Geosci. 9, 490-495.

Oltmans S.J., Karion A., Schnell R.C., Pétron G., Sweeney C., Helmig D., Montzka S.A., Wolter S., Neff D., Miller B.R., Hueber J., Conley S., and Johnson B.J. (2016) O3, CH4, CO2, CO, NO2, and NMHC aircraft measurements in the Uinta Basin oil and gas region under low and high ozone conditions in winter 2012 and 2013. Elem. Sci. Anth. 4: 1-12, doi: 10.12952/journal.elementa.000132.

Helmig D., Stephens C.R., Evans J., Boylan P., Hueber J., and Park J.-H. (2014) Highly elevated atmospheric levels of volatile organic compounds in the Uintah Basin, Utah. Environ. Sci. Technol. 48, 4707-4715, doi:10.1021/es405046r.

Thompson C., Hueber J., and Helmig D. (2014) Influence of oil and gas emissions on ambient atmospheric non-methane hydrocarbons in residential areas of Northeastern Colorado. Elem. Sci. Anth. 3, 000035, 1-17. doi: 10.12952/journal.elementa.000035.

Helmig D., Stephens C.R., Caramore J., and Hueber J. (2013) Seasonal behavior of non-methane hydrocarbons in the firn air at Summit, Greenland. Atmos. Environ., 85, 234-246.

Bariteau, L., Helmig D., Fairall C.W., Hare J.E., Hueber J., and Lang E.K. (2010) Determination of oceanic ozone deposition by ship-borne eddy covariance flux measurements. Atmos. Measurement Techniques 3, 441-455.

BIOGRAPHICAL SKETCH Katherine Potter

SUMMARY

Atmospheric scientist with extensive background and knowledge in atmospheric gas measurements and instrumentation, both system construction and field deployment; Strong technical experience in hardware development, calibration, installation, and troubleshooting of custom multi-component instrumentation and data acquisition systems.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA Ph.D. 2011
Climate Physics & Chemistry
Thesis: Nitrous oxide (N_2O) isotopic composition in the troposphere: instrumentation, observations at Mace Head, Ireland, and regional modeling (Advisors: Prof. Ron Prinn and Prof. Shuhei Ono)

College of William and Mary, Williamsburg, VA B.S. 2004
Chemistry/Environmental Science
Thesis (Highest Honors): Polybrominated diphenyl ether flame retardants in peregrine falcon eggs from coastal Virginia and Maryland (Advisor: Prof. Robert Hale)

POSITIONS

Subcontractor with Boulder A.I.R. LLC, 2021 – present
Flight Scientist, Scientific Aviation, 2021
Applications Scientist, BrightSpec, 2019 – 2020
Station Chief Scientist & Instrumentation Scientist, Rwanda Climate Observatory Project, AGAGE/Government of Rwanda/MIT, 2011 – 2016
Urban Ecology Institute, Boston, MA, 2004 – 2005
Research Laboratory Technician, Virginia Institute of Marine Science, 2003 – 2004

AWARDS

Marblar Technology Idea Competition, 2013 "Chirped Laser Dispersion Spectroscopy (CLaDS)"
NSF-MRI, 2010 "MRI-R2: Development and Deployment of Automated Continuous Wave Quantum Cascade Laser Instruments For On-Site Monitoring of the Four Isotopomers of Nitrous Oxide"
MISTI Hayashi Seed Fund, 2010 "MIT and TITech (Tokyo Institute of Technology) collaboration on isotopomer ratio monitoring of atmospheric N_2O"
Brita College EcoGrant Challenge, 2009 "Solar Air Conditioning System: Design and pilot installation at MIT"
Laboratory for Energy & the Environment, Martin Society for Sustainability Fellow, 2006 – 2011
Jule G. Charney Prize, MIT Department of Earth Atmospheric and Planetary Sciences, 2005
Presidential Fellowship, MIT, 2005
Hypercube Scholar Award, W&M Chemistry Department, 2004

SELECTED PUBLICATIONS

Andersson, A, EN Kirillova, S Decesari, L DeWitt, J Gasore, KE Potter, RG Prinn, M Rupakheti, JD Ndikubwimana, J Nkusi, B Safari (2020) Seasonal source variability of carbonaceous aerosols at the Rwanda Climate Observatory. Atmospheric Chemistry and Physics 20, 4561-4573.

DeWitt, HL, J Gasore, M Rupakheti, KE Potter, RG Prinn, JD Ndikubwimana, J Nkusi, B Safari (2019) Seasonal and diurnal variability in O_3, black carbon, and CO measured at the Rwanda Climate Observatory. Atmospheric Chemistry and Physics 19, 2063-2078.

Harris, E, D Nelson, W Olsewski, M Zahniser, KE Potter, B McManus, A Whitehill, RG Prinn, S Ono (2014) Development of a spectroscopic technique for continuous online monitoring of oxygen and site-specific nitrogen isotopic composition of atmospheric nitrous oxide. *Analytical Chemistry* 86(3), 1726–1734.

Potter, KE, S Ono, RG Prinn (2013) Fully automated, high-precision instrumentation for the isotopic analysis of tropospheric N_2O using continuous flow isotope ratio mass spectrometry. *Rapid Communications in Mass Spectrometry* 27(15), 1723-1738.

Potter, KE (2011) Nitrous oxide (N_2O) isotopic composition in the troposphere: instrumentation, observations at Mace Head, Ireland, and regional modeling. *Center for Global Change Science Report No. 82*, Massachusetts Institute of Technology, http://cgcs.mit.edu/publications/

Potter, KE, BD Watts, M La Guardia, E Harvey, RC Hale (2009) Polybrominated diphenyl ether flame retardants in Chesapeake Bay region peregrine falcon eggs: urban/rural trends. *Environmental Toxicology and Chemistry* 28(5): 973-981.

BIOGRAPHICAL SKETCH Ryan Woodfin Daly

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Colorado, Boulder	MS	2010	Mechanical Engineering, applied to atmospheric sciences
University of Colorado, Boulder	BS	2007	Mechanical Engineering

PERSONAL STATEMENT

My research interests center on land-atmosphere exchange of gases and particles over urban, natural and agricultural landscapes. I have specialized in the development and deployment of custom analytical measurement techniques for the quantification of challenging chemical species in the real world environment. I joined Boulder AIR in the fall of 2021, where I manages air quality monitoring stations that assess the influence of oil and natural gas development on air quality. Before joining Boulder AIR, I served a 10-year career with the US EPA in the Office of Research and Development (ORD) researching the land-atmosphere exchange of volatile organic compounds (VOC) and reactive nitrogen (N_r) from a variety of ecosystems including natural forests, agriculture, and aquatic sources. I led the development of a novel low-cost flux sampling system for the measurement of N_r dry deposition called the COTAG (Conditional Time Averaged Gradient sampling system). The COTAG is expected to be deployed nationally to improve spatial and seasonal monitoring of N_r dry deposition in North America.

POSITIONS AND HONORS

Research Engineer, Boulder A.I.R. LLC, 2021-current.
Physical Scientist, U.S. EPA Office of Research and Development, 2017-2021.
Engineering Technician, U.S. EPA Office of Research and Development, 2011-2017.
Research Assistant, INSTAAR, University of Colorado, Boulder, 2006-2011.

Awards:

2020 EPA ORD Honor Award – deposition.	Bronze Medal	Advancing the science of reactive nitrogen
2017 EPA ORD Honor Award –	Bronze Metal	COWEETA Flux Tower Collaboration Team

CONTRIBUTIONS TO SCIENCE

Development of a novel sampling instrument named the COTAG (Conditional Time Averaged Gradient sampling system), a low-cost flux sampling platform for the measurement of reactive gases and aerosols.

SELECTED PUBLICATIONS

Guo X., Pan D., Daly R., Chen S., Walker J., Tao L., McSpiritt J., and Zondlo M. Spatial heterogeneity of ammonia fluxes in a deciduous forest and adjacent grassland. (In preparation)

Walker J., Chen X., Wu Z., Schwede D., Daly R., Djurkovic A., Oishi C., Edgerton E., Bash J., Knoepp J., Puchalski M., Iiames J., and Miniat C.. Atmospheric Deposition of Reactive Nitrogen to a Deciduous Forest in the Southern Appalachian Mountains. (In preparation)

Walker J., Beachley G., Helen A., Baron J., Bash J., Baumgardner R., Bell M., Benedict K., Chen X., Clow D., Cole A., Coughlin J., Cruz K., Daly R., Decina S., Elliott E., Fenn M., Ganzeveld L., Gebhart K., Isil S., Kerschner B., Larson B., Lavery T., Macy T., Mast A., Mishoe K., Morris K., Padgett P., Pouyat R., Puchalski M., Pye H., Rea A., Rhodes M., Rogers C., Saylor R., Schichtel B., Schwede D., Sexstone G., Sive B., Sosa R., Templar P., Thompson T., Tong D., Wetherbee G., Whitlow T., Wu Z., Yu Z., and Leiming Z. (2019) Toward the improvement of total nitrogen deposition budgets in the United States. Science of the Total Environment, 691:1328-1352. DOI:10.1016/j.scitotenv.2019.07.058.

Walker J., Beachley G., Helen A., Baron J., Bash J., Baumgardner R., Bell M., Benedict K., Chen X., Clow D., Cole A., Coughlin J., Cruz K., Daly R., Decina S., Elliott E., Fenn M., Ganzeveld L., Gebhart K., Isil S., Kerschner B., Larson B., Lavery T., Macy T., Mast A., Mishoe K., Morris K., Padgett P., Pouyat R., Puchalski M., Pye H., Rea A., Rhodes M., Rogers C., Saylor R., Schichtel B., Schwede D., Sexstone G., Sive B., Sosa R., Templar P., Thompson T., Tong D., Wetherbee G., Whitlow T., Wu Z., Yu Z., and Zhang L. (2018) Science needs for continued development of total nitrogen deposition budgets in the United States.

Geron C., Daly R., Arnts R., Guenther A., and Mowry F. (2016) Canopy level emission of 2-methyl-3-buten-2-ol, monoterpenes, and sesquiterpenes from an experimental Pinus taeda plantation. Science of the Total Environment, 565: 730-741. DOI: 10.1016/j.scitotenv.2016.05.034.

Geron C., Daly R., Harley P., Rasmussen R., Seco R., Guenther A., Karl T., and Gu L. (2016) Large drought-induced variations in oak leaf volatile organic compound emissions during PINOT NOIR 2012. Chemosphere: 146, 8-21. DOI:10.1016/j.chemosphere.2015.11.086.

Helmig D., Daly R., Milford J., and Guenther A. (2013) Seasonal trends of biogenic terpene emissions. Chemosphere, 93(1): 35-46. DOI: 10.1016/j.chemosphere.2013.04.058.

Kim S., Karl T., Helmig D., Daly R., Rasmussen R., and Guenther A. (2009) Measurement of atmospheric sesquiterpenes by proton transfer reaction-mass spectrometry (PTR-MS). Atmospheric Measurement Techniques, 2: 99-112. DOI: 10.5194/amt-2-99-2009.

Ortega J., Helmig D., Daly R., Tanner D., Guenther A., and Herrick J. (2008) Approaches for quantifying reactive and low volatility biogenic organic compound emissions by vegetation enclosure techniques – Part B: Applications for quantifying monoterpene and sesquiterpene emission rates. Chemosphere 72: 365-380. DOI: 10.1016/j.chemosphere.2008.02.054.

Project Title: Characterization of Ozone, Ozone Precursors, Atmospheric Volatile Organic Compounds, and Particulate Matter Related to Oil and Natural Gas Operations in Aurora, Colorado

Applicant Information:

Black Parents United Foundation (BPUF)

1445 Dayton St, Aurora, CO 80010

Primary contact: Shere Walker Phone:(303) 725-2649 Email address: blackparentsunitedfoundation@gmail.com

DUNS number: 052769251

Set-Aside: Community-based organization set-aside. BPUF is led by Black, Indigenous, and people of color members of the Aurora community. We are residents of the area targeted in this project and we and our families are directly impacted by the air pollution that this project seeks to address.

Brief Description of Applicant Organization: The Black Parents United Foundation (BPUF) is a 501(c)3 community-based non-profit organization created to empower parents of black and brown children to promote equity, diversity, and inclusion through confidence building, community development, community engagement, and empower their children. We provide scholarships to students in Aurora, Denver, and Adams County Public Schools. We are currently launching a community-led air quality and environmental justice policy-making process.

Project Partner(s):

Cultivando

Project Location: City of Aurora, Colorado; Denver Metro Area; zip codes 80010, 80011, 80012

Air Pollutant Scope: Ozone, Volatile Organic Compounds, methane, and Particulate Matter (PM2.5 and PM10)

Budget Summary:

EPA Funding Requested	Total Project Cost
$499,907	**$499,907**

Project Period: 11/1/2022-10/31/2025

Short Project Description: We will monitor atmospheric ozone, Volatile Organic Compounds, methane, and PM2.5 in the disproportionately impacted BIPOC and low-income communities in Aurora, Colorado, with data to be disseminated in real-time to a web portal for informing the public and the city. Monitoring will provide data to inform a community-led policy-making process and to educate Aurora community members, elected officials, and policymakers on air pollutants and environmental justice.

Workplan

Section 1: Project Summary and Approach

A. Overall Project Summary

This proposal focuses on disproportionately impacted communities in Colorado, including people of color and low-income families, who may be exposed to air pollution due to oil and natural gas (O&NG) development near the Denver Metro Area (DMA). The study is proposed in the City of Aurora, the third largest city in Colorado. The technical parts of the project will be subcontracted to Boulder AIR, a local company run by Dr. Detlev Helmig that provides high quality air monitoring, including to Boulder and Broomfield Counties and the Colorado Department of Public Health and Environment (CDPHE). According to EJ Screen, Aurora represents a population center for the groups that generally experience environmental injustice. In addition, Aurora has been experiencing increased oil and gas well drilling within and just outside its city limits in recent years, prompting members of the community to seek information and help for assessing air quality impacts. This project will monitor ozone, methane, particulate matter, and volatile organic compounds (VOC) to understand the regional impacts of O&NG drilling on vulnerable Aurora communities.

The Denver Metro Area has experienced rapid expansion of drilling of shale and tight sands oil and natural gas reservoirs due to advances in hydraulic fracturing and horizontal drilling technologies. Until a few years ago, O&NG activities were primarily in rural areas. More recently, urban communities have been increasingly subjected to drilling, raising concerns regarding the environmental impacts on citizens. One of the primary emissions from O&NG activities are VOCS, which are linked to two human health concerns. A number of studies suggest that direct exposure to selected VOC, as well as synergistic effects of exposure to the mix of diverse VOC, may be more severe than previously recognized, warranting more attention and research. Second, VOC emissions indirectly affect human health because they contribute to regional ozone pollution. The DMA is also currently designated as a federal ozone serious non-attainment area for the ozone National Ambient Air Quality Standard (NAAQS) standard [EPA,2019]; O&NG emissions have been suggested to contribute significantly to ozone NAAQS exceedances in Northern Colorado, including the DMA (Bien and Helmig, 2018;; elmig, 2020). Exposure to elevated ozone is linked to asthma.

This application is motivated and developed in coordination with several Aurora community partners who are concerned that there is currently no air monitoring in Aurora that allows evaluating air quality and health impacts from oil and gas development and other industries within the city. This lack of state or local air monitoring means that community members do not have access to any air quality data to inform their understanding of the conditions in which they live. A mobile air monitoring laboratory will be funded through this grant to monitor air quality in areas of Aurora that are home to people of color and low-income families. The monitoring data will be provided to the public in real time through an open web portal. Project progress and outcomes will be shared with community partners, Aurora residents more generally, and City of Aurora officials and policymakers. We will conduct these studies in coordination with a project funded by the Colorado Department of Public Health and Environment (CDPHE) to raise awareness of air pollutants in the Aurora region. The data this project supplies will provide a strong empirical basis for discussing air pollutants with the Aurora community. In summary, this project will yield an extensive and detailed characterization of urban air pollutants related to O&NG and other influences, and communicate this information to Aurora residents, elected officials, and policy makers.

Air Monitoring

One mobile air monitoring trailer will be established and moved from site to site within the city for the duration of 1.4 years. The sites will be selected in areas of the city where people of color and low-income families live in greatest numbers. Two sites have already been selected, as attested in our partnership letters, in parts of Aurora that rank in the 70th to 90th percentiles nationwide for people of color. In particular, this project seeks to provide information about the impacts of O&NG development on these communities that are most vulnerable to environmental impacts.

Our proposal includes monitoring of the primary pollutants that have been shown to impact health. An EPA study projected that by 2025 air pollution from oil and gas operations will be responsible for 37 premature deaths due to PM2.5, and 34 premature deaths due to ozone every year (Fann et al., 2018). With the density of existing and newly planned wells in Aurora, it is very probable that many of the health impacts and associated deaths are occurring in Aurora. Our proposal will address this question by providing high accuracy monitoring of ozone and Particulate Matter and their precursors. Therefore, the air monitoring will capture these pollutants: Ozone, VOCs, methane, and particulate matter. There will also be collection of meteorological data, including temperature, humidity, wind direction, wind speed, and solar radiation. All measurements will be of regulatory quality following EPA and CDPHE procedures. Calibration gases and standards will have of EPA-grade of World Meteorological Organization-Global Atmospheric Watch certification. The monitoring will be fully automated, continuous, 24/7, and for 1.4 years. The time resolution of measurements data will be one minute for all species, except for VOCs, which will be measured over a ten-minute time interval once every hour. All monitoring and equipment will be analogous to the currently ongoing air measurements that are conducted by Boulder AIR in the Colorado Front Range (https://bouldair.com/). Currently, there are eight stations in operation. This will make all results fully comparable to the data collected at these other locations and allow easy comparison and evaluation of observed pollutant levels. Further details on instrumentation and data quality assurance protocols are provided as a Supplementary File in this proposal.

All measurements will be reported on a project-dedicated public website in real time. Results will be presented in tabulated format and as time series graphs. An instantaneous air quality conditions index will place current air quality into one of six possible rankings (i.e. Good, Moderate, Unhealthy for Sensitive, Unhealthy, Very Unhealthy, Hazardous; see for instance the Boulder AIR Commerce City website: https://www.bouldair.com/commerce_city.htm).The observation data will also be included in a dedicated website display that compares the instantaneous observations with those from neighboring Colorado Front Range sites (https://www.bouldair.com/NoCoFrontRange.htm). Furthermore, the Aurora data will be included in the Boulder AIR Interactive Data Analysis Tool (IDAT, http://www.bouldairtools.com/interactive/) that allows users to view and analyze recorded data retrospectively. Data will be archived in three secure locations and be shared with interested external parties following a data sharing agreement, according to the agreements that are currently in place for programs with the other sponsoring municipalities.

Data Analyses

Besides the real-time reporting of the data to the public, Boulder AIR also provides advanced data analysis and interpretation. Summed VOC classes and total VOC will be determined from results of individual compounds. VOC tracer compounds (i.e. propane for O&NG; acetylene for transportation) and VOC/VOC and VOC/methane relationships will be used to decipher contributions from various emission categories (transportation, urban, agriculture, O&NG) [*Gilman et al.*, 2013; *Thompson et al.*, 2014]. VOC diurnal cycles and daytime/nighttime concentration differences will be determined. VOC and wind data will be used for generating bivariate wind diagrams that provide

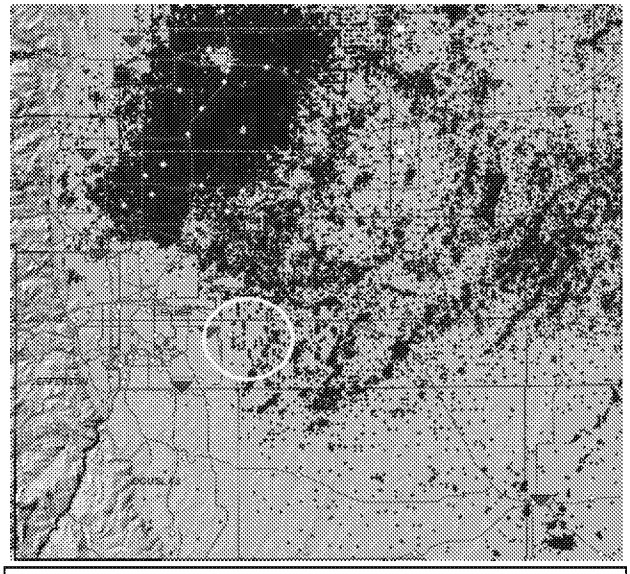

Figure 1: O&NG wells in the wider Northern Colorado Front Range. The City of Aurora area is marked by the yellow circle.

identification of pollution source regions. Potential Source Contribution Function (PSCF) [*Pekney et al.*, 2006] analyses are another tool to be used for characterizing air pollution transport and emission sources. Quantitative results for each site will be statistically presented in box-whisker plots and evaluated with available data from other locations, including from the other Colorado stations, and similar size cities with and without O&NG, , and observations from rural areas. Health effects of observed pollutants will be evaluated using available health exposure thresholds.

B. Project Significance

The Northern Colorado Front Range, including the DMA has experienced rapid expansion of drilling oil and gas reservoirs in recent years due to advances in hydraulic fracturing and horizontal drilling technologies (See Figure 1). These new technologies have increased drilling activities in populated regions, raising questions about impacts of O&NG activities on human health. Numerous studies suggest that fugitive emissions from O&NG operations can result in elevated atmospheric levels of methane and VOCs, with non-methane hydrocarbons (NMHC), including air toxics (aromatic compounds) being the predominant VOC species [*Gilman et al.*, 2013; *Swarthout et al.*, 2013; *Thompson et al.*, 2014].

Health effects from long term exposure to elevated VOC are poorly defined; a number of studies suggest that health impacts from selected VOC as well as synergistic effects of exposure to the mix of diverse VOC in O&NG emissions may be more severe than previously recognized [*McKenzie et al.*, 2012; *Colborn et al.*, 2014; *McKenzie et al.*, 2017]. Emissions of O&NG VOC have also been shown to contribute to regional ozone production [*Helmig, 2020*]. Benzene is of particular concern as a known carcinogen; lifetime exposure to 1.7 μg m^{-3} (~ 0.5 ppb) of benzene increases the risk of cancer by 1 in 100,000 [*EPA*, 2013]. In addition, ozone exposure is linked to increased rates of asthma, especially among children [*Lin et al.*, 2008]. The DMA has been designated a serious ozone nonattainment area and is on a trajectory to be further downgraded to 'severe' status [*EPA,* 2019]. Thus far, however, most research has focused on O&NG emissions in Weld. No studies have comprehensively addressed the question of O&NG influences in the DMA and the confounding effects of oil and gas emissions mixing with abundant urban air pollution.

Our project aims to fill this gap by taking a focus on regional impacts of O&NG development on the urban area of Aurora. With nearly 370,000 residents, Aurora is the third most populous city in Colorado and home to a diverse community. Compared to statewide demographics, Aurora has a much higher percentage of residents who are Black and multi-racial. Aurora residents also have a significantly lower median income than can be found statewide. Communities in Aurora have been

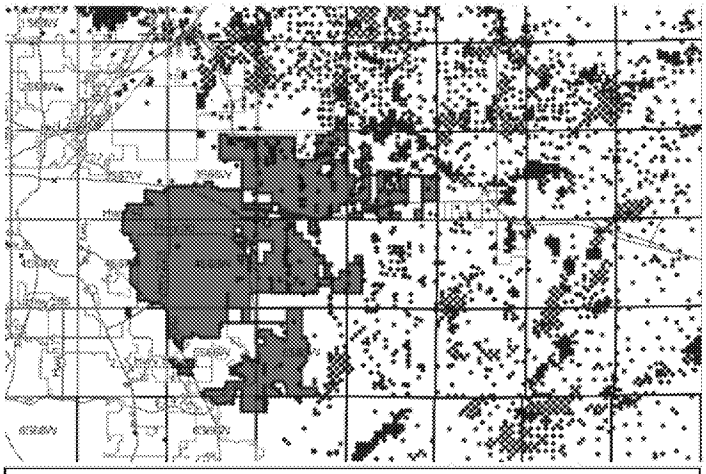

Figure 2: Wells established in and near City of Aurora (blue area)

seeking transparency in response to the potential health and quality of life impacts from the expansion of the O&NG industry [Colorado Independent, 2019]. Citizen concerns about drilling have not prevented the Aurora city council from continuing to approve O&NG wells within the city limits without accounting for the cumulative impacts of air pollutants in the region [Woodruff, 2019]. Aurora is the site of four major highways which already significantly impact the air toxins to which residents are exposed. Adding O&NG development to these existing sources of pollution may increase the burden of pollution on Aurora residents.

Hundreds of O&NG wells have been established within and near the city (Figure 2). Additional wells have been approved within the Aurora city limits, and the cumulative impact of O&NG emissions may be affecting the air quality across Aurora (Figure 3). Our project seeks to provide information to Aurora residents, elected officials, and policymakers about the pollutants related to O&NG development in their communities. Thus far, there have been no monitoring efforts to assess air quality and health impacts from the growth of the O&NG operations in and near Aurora. This application addresses this deficiency by proposing an extensive monitoring of primary pollutants. By providing this data to residents in Aurora who may be impacted by these pollutants, this project will increase understanding of the conditions in which they are living. It will allow residents to advocate for healthy air quality in their communities, if indeed evidence of high pollutant levels are found. Furthermore, providing this data to Aurora elected officials and policymakers will allow them to make informed decisions about the impacts of permitting fracking in Aurora.

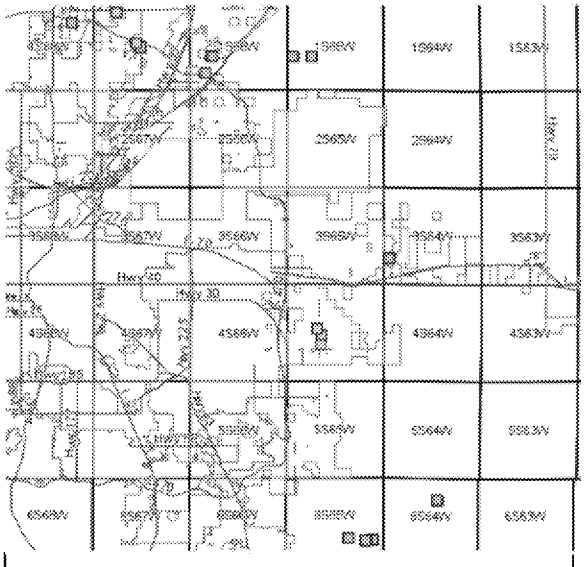

Figure 3: New well permits pending (blue squares) and approved (green squares) in Aurora area

Section 2: Community Involvement

A. Community Partnerships

Black Parents United Foundation (BPUF) is a non-profit community-led organization. Our team members live in and near Aurora, Colorado, and thus are residents impacted by the air pollution we seek to monitor. All but one of our team are Black, Indigenous or Latin(o)(a)(x). We have identified this project because our lived experiences tell us that air quality affects us day-to-day. Several of our board members live near the many highways that cut through Aurora, where we are exposed to ground-level ozone and particulate pollution. Another of our board members has a daughter who deals with one of the health disparities we seek to address with this project:

childhood asthma. As such, all of the aspects of this project have been identified and developed by community members who have direct experience with the hazardous environmental conditions that we seek to address.

Although we are community members, we know that we do not represent all points of view or concerns within Aurora. We have cultivated partnerships, represented in the supplementary letters, with Cultivando and Mom's Clean Air Force, community-led organizations that will help us conduct outreach to the Aurora community to ensure that the data we collect through this project will reach those who most need to learn about the impacts of O&NG development. Furthermore, Cultivando is already running a similar, successful air monitoring program in Commerce City. They will help us launch this program by providing support to us on how best administer an air monitoring project. Mom's Clean Air Force will receive benefit from this project because they will gain data to support their work to maintain good air quality statewide in Colorado. Cultivando will benefit because the work that they are already doing in Commerce City will be expanded by this project to include a larger population.

We have also sought input from members of the Aurora community who are concerned about the impact of fracking on their wellbeing. Four have submitted supplementary letters of support and will help BPUF to do outreach in Aurora communities to ensure that residents who are impacted by the data that we gather get the full information that this project is able to provide. Two of these community members have agreed to allow us to place the air monitoring trailer at their residences because they are concerned about the impacts of O&NG development and they wish to support, and benefit from, this project. As concerned citizens and residents of the areas being monitored, these members of the community will be benefitted by this project because they will learn about the pollutants to which they are exposed.

B. Community Engagement

Boulder AIR will be in communication with BPUF and all community partners throughout the study. A public website will present a project description, updates, tabulated and graphical display of data, and a communication link for citizens to submit inquiries. Open, bi-annual project update meetings, including presentation of preliminary results will be co-organized by BPUF and Boulder AIR. These will be held in Aurora with all community partners, Aurora elected officials and policymakers, and the public invited. The Boulder AIR principal investigator, Detlev Helmig, has previously presented on approximately 30 such occasions to more than 2000 citizens on air quality impact aspects of O&NG development.

Furthermore, this air monitoring project will be conducted in coordination with and support of a project to conduct community-led policy making around air quality and environmental justice. This project also involves outreach to the wider Aurora community about environmental justice and health impacts of air pollution. CDPHE is funding our work to build a network of leaders in Aurora who are affected by environmental injustices and seek to improve air quality for all members of their communities. Our plan, funded by the CDPHE grant, involves five leadership trainings over the next year that will expand the knowledge and skills of community leaders, including those who wrote support letters for this grant, about environmental justice and air pollution in Aurora. Once this cohort is established, they will become the Environmental Justice Advisory Board for BPUF and remain key members of the team that will create our strategy for use of the data collected in this grant. They will also support our efforts to communicate the outcomes of the study to the broader Aurora community.

All letters of support are included as Supplementary Files in this proposal.

C. Community-Based Organization Set-Aside

BPUF was founded in 2019 and formed a 501(c)3 in 2021. We have grown significantly as our communities have shown us that the work, we do is important to them. At present, we administer two scholarships for youth in the Aurora, Denver, and Adams County Public School districts. We are currently launching our first environmental justice program, which this EPA funding request will support in part. In spite of our newness as an organization, we have an experienced board and staff that can support the work plan. Furthermore, as members of the Aurora community, many of BPUF' team members witness on a daily basis the impacts of air pollution and the disproportionate rates of childhood asthma (alongside other health impacts) that it creates. The following people lead our organization, and represent the BIPOC and low-income Aurora communities that we seek to support through this project:

Shere Walker, BPUF Executive Director, runs a successful small business and has ten years of experience in education that will support our project's goal of educating our fellow community members on environmental injustices. She has a Masters of Education in Curriculum and Instruction with an emphasis of Equity, Ethics, and Justice. This experience will support our goal of making our outreach as inclusive as possible.

Board Member Clay Walker works in media and production. His skills as a videographer will help us prepare engaging materials to communicate the findings of this project to our communities.

Board member Fumnanya Camara runs a successful small business and has over ten years in education where she supports minority students in overcoming barriers of success.

Board member Sharnell Smith has over seven years in secretarial and office manager work experience. She currently works in the Denver and Aurora Community to help organize many community and family relationship functions. Her skills as an office manager will help with administrative, customer and client service.

Section 3: Environmental Justice and Underserved Communities

Aurora represents one of the centers of population in Colorado for the vulnerable groups most likely to be disproportionately impacted by environmental harms. Existing data available from EJ Screen show that Aurora falls into the 90-95th percentile nationally for ozone levels and the 50-60th percentile for PM2.5 pollution. Aurora also has a concentration of environmental justice populations, as the city falls between the 70th and 90th percentiles of people of color and the 60th-95th percentiles nationally for low-income families. Furthermore, the pollution in the area may be linked to Aurora falling into the 80th-90th percentile for rates of asthma. All of these factors point to Aurora as an important site for increased air monitoring to understand and prevent these disproportionate environmental impacts on vulnerable populations.

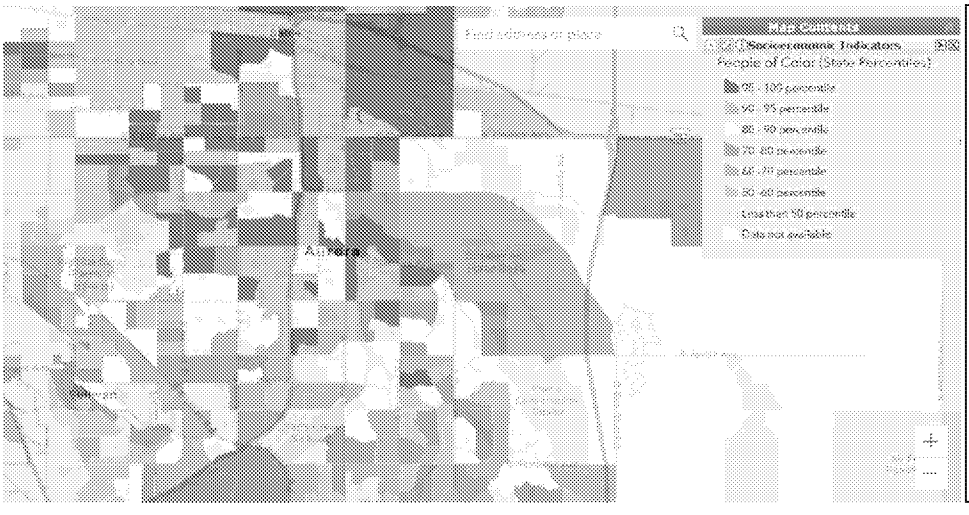

Figure 4: Aurora, CO People of Color State Percentages from the EPA EJ Screen tool.

Currently, one of the most significant barriers to Aurora citizens' understanding of their environment is a lack of data. Without detailed monitoring of pollutants in their communities, many Aurora residents remain unaware that they may be experiencing disproportionate harm from these pollutants. Yet, the availability of funding for community air monitoring has been very limited, and this grant provides an opportunity to fill a major knowledge gap for people of color and low-income families in this region. This project will help us to present concrete data to Aurora residents as well as the officials and policymakers who regulate the sources of these pollutants. Such data will support constructive conversations about how best to support better health outcomes, especially regarding asthma, among the vulnerable populations that live in Aurora. This information will empower community members and policy makers for a more informed, educated, and socioeconomically fair discussion on future O&NG development. Moreover, findings from this study will help guide other communities in Colorado and the US in directing O&NG development.

Section 4: Environmental Results: Outcomes, Outputs, Performance Measures

A. Expected Outcomes and Outputs

This project has multiple short-term, mid- term, and long-term benefits. It addresses citizen's concerns about air quality by providing high quality observations of atmospheric contaminants over a full annual cycle, interpretation of results, and a preliminary health impact assessment. Citizens and officials will be educated on all of these aspects, and their questions will be answered to the best of our ability. The study will yield a detailed spatial and temporal characterization and interpretation of urban pollution resulting from O&NG influences. The study will increase community awareness of atmospheric impacts of O&NG on air quality. The monitoring will follow regulatory protocols and attain regulatory quality, where applicable (ozone, PM), of WMO-GAW guidelines (methane). Data will be submitted to the EPA Air Quality System (AQS) for wide dissemination and use by researchers and air quality regulators. The public, state regulators, policy makers, and industry will be in a better position to make decisions on impacts and evaluate VOC emissions and exposure for reducing health effects relating to O&NG development in urban areas. Table 1 lists a summary of performance measures that will be tracked. Execution of the monitoring, reporting on schedule, achieving satisfactory data coverage, and the data quality necessary for publication of the study's findings in a peer-reviewed journal are critical goals and performance measures.

B. / C. Performance Measures and Plan/Timeline and Milestones

Table 1. Performance Measures

Time after project start (months)	**Milestone**	**Performance Measure**
4-36	Quarterly Reports	Meet Schedule
4	Field Site setup	Meet Schedule
6	Begin 1-yr monitoring	Meet Schedule, >95% data coverage, data quality to meet regulatory standards

24	End of monitoring	3-month monitoring each at 5 sites in target neighborhoods
20-30	Community Outreach/Presentations	Meet Schedule
24	Data QC finalized	Meet Schedule
30	Interim Final report	Meet Schedule
36	Final report, project end	Meet Schedule

Section 6: Programmatic Capability and Past Performance

Shere Walker, BPUF Executive Director, will serve as the program director to ensure proper collaboration between BPUF and Boulder AIR. She has ten years of experience in education and five years of experience as a program administrator for various education programs within public school systems. Shere is also a successful small business owner. Her experience administrating programs means that she has the skill set to successfully direct the project proposed in this grant. The Project Lead position, which will be to handle day-to-day operations and community collaboration, will be hired if BPUF is awarded this grant.

While BPUF's recent formation means that we have not administered a major grant before, but our strong connection to the Aurora community and the people who are most vulnerable to environmental injustice means we have personal commitments to ensure proper handling of this project. We believe our partnership with Cultivando, which has successfully launched a similar program, will provide adequate support for administering this grant.

To further ensure expert implementation of this air monitoring, BPUF will subcontract with Boulder AIR. Dr. Helmig, principal of Boulder AIR, has a long record of contract work for regional and federal government agencies, including EPA and CDPHE. Data coverage of all currently ongoing monitoring programs is well > 95%. Over the past five years Boulder AIR has been contracted by Colorado communities to provide regional air quality monitoring. These yearly contracts are subject to rigorous review and have been renewed regularly. Dr. Helmig has been conducting research on measurement techniques, air quality, and atmospheric chemistry and transport for some 35 years, with >200 peer-reviewed publications reporting on results. During his University of Colorado tenure, fifty-eight undergraduate and 17 graduate students have been mentored, and two graduate students were subsequently employed by the EPA.

Detailed resumes for Shere Walker and the Boulder AIR team are included in this proposal as Supplementary Files.

Section 7: Budget

A./B. Detailed Budget Narrative and Reasonableness of Costs

This project will be executed through a subcontract to Boulder AIR (Table 2). Dr. Helmig will be responsible for directing the monitoring program, contribute to the fieldwork, data processing and quality control reporting, and will be the point of contact for the community partners. Other Boulder AIR staff will assemble and install the field monitoring equipment, maintain the instrumentation, and build the program website and do the data management. Boulder AIR submitted a project budget,

included below, based on standard costs used at their air monitoring program. This proposal covers set up, maintenance, and data analysis for one mobile monitoring trailer. The budget follows the same rates and cost structure as for other currently ongoing air monitoring programs (https://bouldair.com/). The costs include the instrument and equipment acquisition, integration into the monitoring trailer, all calibration equipment and standards, and a minimum of 1.4 years of continuous air monitoring, with the monitoring trailer to be deployed at a minimum of four locations within the City of Aurora. All staff salary, mileage, administration costs, insurances, computers, server time, administrative costs, data analyses, reporting and presentations, etc. are factored into these expenses.

EPA Funding Request Budget Table	**EPA Funding****	
Personnel		
(1) Project Director @ $70/hr x 6 hrs/wk x 36 wks	$15,120	
(2) Project Lead @ $38.50/hr x 10hrs/wk x 36 wks	$20,790	
TOTAL PERSONNEL	$35,580	
Fringe Benefits		
TOTAL FRINGE BENEFITS	$0	
Travel		
Mileage for PM: 5 miles/wk @ $.585/mi x 36 wks	$105	
TOTAL TRAVEL	$105	
Equipment		
Equipment costs will be covered by subcontract with Boulder AIR	$0	
TOTAL EQUIPMENT	$0	
Supplies		
Supplies will be covered by subcontract with Boulder AIR	$0	
TOTAL SUPPLIES	$0	
Contractual		
Non-competitive contract with Boulder AIR to conduct air monitoring	$463,905	
TOTAL CONTRACTUAL	$463,905	
Other		
TOTAL OTHER	$0	
Indirect Charges		
N/a	$0	
TOTAL INDIRECT		$0
TOTAL FUNDING	**$499,920**	
TOTAL PROJECT COST††	**$499,920**	

Item	Variable	Cost US$
1	Ozone, TEI_49, regulatory-like	31,558
2	Volatile Organic Compounds (including ethane, ethene, acetylene, propane, propene, i-butane, n-butane, i-pentane, n-pentane, isoprene, n-hexane, benzene, toluene, o-xylene, ethylbenzene, o-xylene, m-xylene, p-xylene); custom-inlet system; gas chromatography - flame ionization detection, WMO-grade	199,865
3	Methane, PICARRO G2301, WMO-grade	88,361
4	PM_2.5, PM_10, GRIMM EDM180, regulatory-like	56,804
5	Meteorological variables (wind speed, wind direction, temperature, relative humidity, radiation), research-grade	9,467
6	Power, communication	6,250
7	Instrument Trailer	20,000
8	Security system with multiple webcams	3,600
9	Website data reporting, data management	48,000
Total:		463,905

C. Expenditure of Awarded Grant Funds

BPUF will implement the following approach, procedures, and controls to ensure compliance of our expenditures with the EPA grant requirements:

1. Determine Programmatic Activities that are Grant-Compliant
    a. Specify which tasks and activities are covered under the EPA grant
    b. Allocate budget (work hours) to the air monitoring project
    c. Anticipate project burn rate while working to achieve the impact we specified
2. Comparing a realistic timeframe of the grant oppose to the run time of the project
    a. Following the goals in the grant application
    b. Working backwards from the duration of the grant and impact of the application
    c. Continual evaluation of milestones and adjustment of activities (internally first then externally)
    d. Use internal records as tool for details
    e. Keep an open communication with program staff and contractor
3. Make accurate and transparent reporting
    a. Keeping accurate timesheets of workers and contractor billing
    b. Keeping accurate record-keeping with the support of an accountant

Attachment A - References Cited

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CULTIVANDO
Leadership • Advocacy • Collaboration

March 17th, 2022

Black Parents United Foundation (BPUF)
1445 Dayton St, Aurora, CO 80010

To BPUF:

I am writing in support of Black Parents United Foundation (BPUF) and their proposal for the Environmental Protection Agency grant to fund the Enhanced Air Quality Monitoring for Communities, which will support their work in creating equity in Environmental Health for people of color in Aurora, CO. This proposal is of significant interest to me, as Director of Environmental Justice Program at Cultivando.

Cultivando is a non-profit organization that serves the Latino community in Adams County and focuses on community leadership to advance health equity through advocacy, collaboration, and policy change.Our work is based on our organizational values of community-led work, social justice, and collaborative leadership. We firmly believe that all people have the power to maintain fair and equitable systems and to ensure opportunities for their communities to thrive.

We support this proposal because we recognize the importance of environmental health for the people of Aurora. We know that by monitoring the air, we will, as a community, not only support the Earth's ecosystem, but also the health and ecosystem of the community. Cultivando and the community will benefit from this project because we will be able to cultivate a deeper relationship with the Earth, feel motivated to advocate for systems wide policy change around environmental health, which will have significant implications on long term health equity related to environmental determinants of health. Cultivando is committed to working from a community-responsive approach, so it is also important to note that we will support BPUF by providing guidance on this project from our own experience leading a community-based air quality monitoring project. We see our role as bringing our skills, resources, and expertise to elevate the voices of community members and to help ensure the accessibility and the success of this project.

Cultivando is focused on promoting health equity through environmental health for the Latinx community of Commerce City and looks forward to being a part of this excellent work.

If you would like to speak with me about my endorsement of this proposal, please call me at 720-475-8586 or email me at aracely@cultivando.org.

Sincerely,

Aracely Navarro
Director of Environmental Justice Programs
Cultivando

Moms Clean Air Force Colorado

Denver, Colorado 80207

(303) 994-2421

soliver@momscleanairforce.org

Shaina Oliver, State Coordinator

March 10, 2022

Dear BPUF:

I am writing regarding our partnership and support of Black Parents United Foundation taking the lead in providing an air toxins program due to fracking in the Aurora community through the EPA program.

My name is Shaina Oliver, I'm a state coordinator with Moms Clean Air Force and EcoMadres Colorado Chapters. Most importantly I am a mom of four kids, and we are tribal affiliates of the Navajo Nation currently residing in Northeast Denver. As an Indigenous woman it's important to protect our children from harms way. And growing up I experienced and lived a Native American perspective. With that perspective I've learned how much harm comes from environmental unjust policies and laws, which has historically harmed First Nations right to protect ancestral lands and traditional ecological knowledge. Because of these inequities in policy and laws, Indigenous rights were ignored for over 574 First Nations. Including the Navajo Nation who seen the harms firsthand on several occasions with oil and gas, coal, uranium, and water. And the impacts on health on Indigenous People have been higher than the general public, where we suffer from one or more of either asthma, diabetes, cancer, heart disease, adverse birth outcomes, mental illness, and premature death.

And with my work in the community of the Denver Metro area, I learned about the environmental harms that have impacted the communities here in the Northern to Northeastern areas of Colorado. Importantly, I noticed that Black, Brown, Indigenous, and low-wealth community members and families experience similar harms that Indigenous people have experience after being exposed to higher pollution levels than communities with less pollution exposures. And today we are still seeing division of who becomes sacrificial and who will live near the highways, gas plants, refinery, waste site, superfund, etc... Therefore we need partners like Black Parents United Foundation to lead the community in this project of

monitoring air toxins. So that Black, Brown, Indigenous, and Low-Income parents can understand the harms in the air can have an impact on our long-term health and even generations ahead of us will be impacted by the air toxins we breathe and leave behind.

So many of us are living under the shadow of one these health conditions, like myself I must live with asthma in a state whose air quality has become worst state to breathe in. All children and communities deserve to know what their breathing in and what's leeching in our bodies, and how can we reduce health impacts collectively.

Thank you for taking the time and Moms Clean Air Force Colorado Chapter strongly support Black Parents United Foundation to take the lead in providing the Air Monitoring Program for the community.

Shaina Oliver, Dine/Navajo

Indigenous Peoples' Rights Advocate

Coordinator, EcoMadres/Moms Clean Air Force CO

Email:soliver@momscleanairforce.org

Ph: (303) 994-2421

Kristin Bishop

5076 S. Evanston St.

Aurora, CO 80015

Dear Black Parents United Foundation:

I am a high school teacher. I am a new resident in Aurora but I have been doing research and see how fracking is an extreme health and environmental concern. I wondered where the fracking sites were and did not know they were in Aurora until recently. There are so many fracking wells all around Aurora, and I definitely wonder what impact this has on me, the students I teach, and the rest of my community. Keep in mind most of these sites are placed in communities and schools. Why is that? **Unfortunately, not a lot of information is known to the community on the impact fracking has**, but seeing the videos and taking the initiative to educate myself about fracking includes health issues such as asthma, air pollution, and soil pollution. **This is very frightening and something should be done about this!**

To support you, I will help with outreach to those I know in Aurora to make sure everyone gets information from this air monitoring project. To even educate myself and the community even more, I will also be happy to have the air monitoring trailer placed on my property to understand what is going on in my neighborhood. Thank you for bringing this to my attention.

Best,

Kristin B.

Dr. Tameka Brigham

5041 S Malaya Way

Aurora, CO 80015

Dear Black Parents United Foundation:

I am currently a resident in Aurora and I know the impact of fracking and the air quality concern. I am 100% on board with supporting BPUF in their efforts to educate the BIPOC community on air toxins. As an expert in critical race theory, education, and community organizing with an extensive background in non-profit, it saddens me because our communities are so behind in information and understanding fracking and the danger it causes. Not only that, but these sites are in Aurora! This is the reason why I back BPUF in not only outreaching, but **commend them in having boots to the ground in this work.** I would be curious to know the results they find.

To extend my support, I will help with outreach in all Aurora to make sure everyone gets information from this air monitoring project. I am willing to have the air monitoring trailer placed on my property so BPUF can get the information they need. This only helps me, but also my community.

Thank you.

Dr. Tameka Brigham, Ed.D

To BPUF:

I am a local resident of Aurora, CO and Aurora Business Owner who fully supports the Black Parents United Foundation project to monitor air in Aurora due to the fracking that occurs. **Unfortunately due to the black community's lack of knowledge around environmental justice and air quality, this process can go wrong in many ways.** Fracking puts me, my family, and community in danger. We are very concerned because these sites are not far from my home and are built close to schools, playgrounds, and clusters of family homes. If the oil or gas wells are not built sturdily enough, they can leak and contaminate groundwater and air.

Due to the unhealthy level of smog, I know this causes constant eye and throat irritations. We do not want to procrastinate until something catastrophic occurs such as respiratory illnesses, central nervous system damage, birth defects, cancer, or premature death.

Community role will include:

- Support BPUF air monitoring of increasing fracking in Aurora because of health concerns.
- Help BPUF raising awareness in the community using the data so we can have a better understanding of environmental justice and disparities

We, the Aurora community, look forward to working with BPUF in eliminating health disparities in Aurora and will do our best to bring awareness to those in my neighborhood.

Sincerely,

Solelymane Camara
Concerned Community Member
Aurora Business Owner
Email: asm@allsoulmobile.com
Phone: 720-216-0343

March 21, 2022

Dear Black Parents United Foundation:

I am a local resident of Aurora, CO and a Licensed School Counselor who fully supports the Black Parents United Foundation project to study air quality in Aurora potentially funded from the Environmental Protection Agency. I strongly support this funding to be used in the Aurora Community.

As a school counselor and resident, I find it very unfortunate that our Aurora residents do not understand the potential danger, health, and education concerns fracking can cause.

Fracking sites release a toxic stew of air pollution that includes chemicals that can cause severe headaches, asthma symptoms, childhood leukemia, cardiac problems, and birth defects. Fracking is happening in our school community, playgrounds, and public areas in which our students and families occupy. As a black community member, we cannot afford to deal with any of these types of health reasons. **Also, as a school counselor in the community, our children cannot afford these types of health issues. Fracking can cause students to not reach their full potential. Students can miss school because of illnesses or taking care of sick family members not knowing that some of their health issues could be derived from the air we breathe.**

I am curious to know the correlation between air quality, student learning, and health issues that students and their families may have. We, the Aurora community, back BPUF in eliminating these types of health concerns in Aurora and the future of our children by supporting their efforts in outreach and/or educating our community on environmental justice issues that we currently face.

Sincerely,

Patrice Bradford Collor, MSC

Denver Public Schools - School Counselor

Attachment A - References Cited

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Manifest for Grant Application # GRANT13580605

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 23831 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16011 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24126 bytes)

3. Form SF424A-V1.0.pdf (size 22850 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22602 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 15914 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37177 bytes)

Attachments Included in Zip File (total 7):

1. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1240-Supplemental File F - BPUF Proof of Nonprofit Status.pdf application/pdf (size 61476 bytes)

2. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1239-Supplemental File E - Resumes of Key Personnel.pdf application/pdf (size 446900 bytes)

3. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1234-Project Narrative Final.pdf application/pdf (size 778095 bytes)

4. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1236-Supplemental File B - Data Quality Assurance and Quality Control Protocols.pdf application/pdf (size 119152 bytes)

5. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1238-Supplemental File D - Community-based Organization Documentation.pdf application/pdf (size 70176 bytes)

6. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1237-Supplemental File C -Partnership Letters.pdf application/pdf (size 436995 bytes)

7. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1235-Supplemental File A - References Cited.pdf application/pdf (size 132164 bytes)